Module 4: Virginia Erosion & Sediment Control Program (VESCP) Regulations

Module 4 Objectives

After completing this module, you will be able to:

- Navigate the Erosion Sediment Control (ESC) Regulations
- Locate information in the Regulations pertaining to the 19 Minimum Standards
- Gain a background in stormwater management
- Apply the minimum criteria needed to the administer a VESCP
- Better understand how a variance is received/processed.
- Understand the integration of ESC Regulations with SWM Regulations

Module 4 Content

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4.a Introduction

Virginia Erosion & Sediment Control Regulations - Overview

The following module is an introduction to the Virginia Erosion & Sediment Control (VESC) Regulations. A full copy of 9VAC25-840 can be downloaded at: http://www.deq.virginia.gov/Programs/Water/LawsRegulationsGuidance.aspx

Historic Overview.

Section 62.1-44.15:52.A. of the Virginia Erosion and Sediment Control Law requires that "*The Board shall develop a program and adopt regulations in accordance with the Administrative Process Act (§ 2.2-4000 et seq.) for the effective control of soil erosion, sediment deposition, and nonagricultural runoff that shall be met in any control program to prevent the unreasonable degradation of properties, stream channels, waters, and other natural resources.*"

The VESC Regulations were first adopted on September 13, 1990, with revisions in 1995, 2012 and 2013. A primary objective in developing these regulations was to adopt a set of statewide "Minimum Standards" that provide a set of clear cut rules for the control of erosion and sedimentation on construction sites. It was expected that these Minimum Standards would be mutually understood by the plan preparer, plan reviewer, developer, and inspector, and allow for equal enforcement of these rules throughout the state.

An equally important objective was to preserve flexibility so that the use of innovative ESC techniques would be allowed, in an attempt to maximize cost effectiveness and efficiency in erosion and sediment control.

The 2012 revisions aligned these regulations with the recently passed stormwater regulations; the 2013 revision addressed the move of the program from the Department of Conservation and Recreation (DCR) to DEQ.

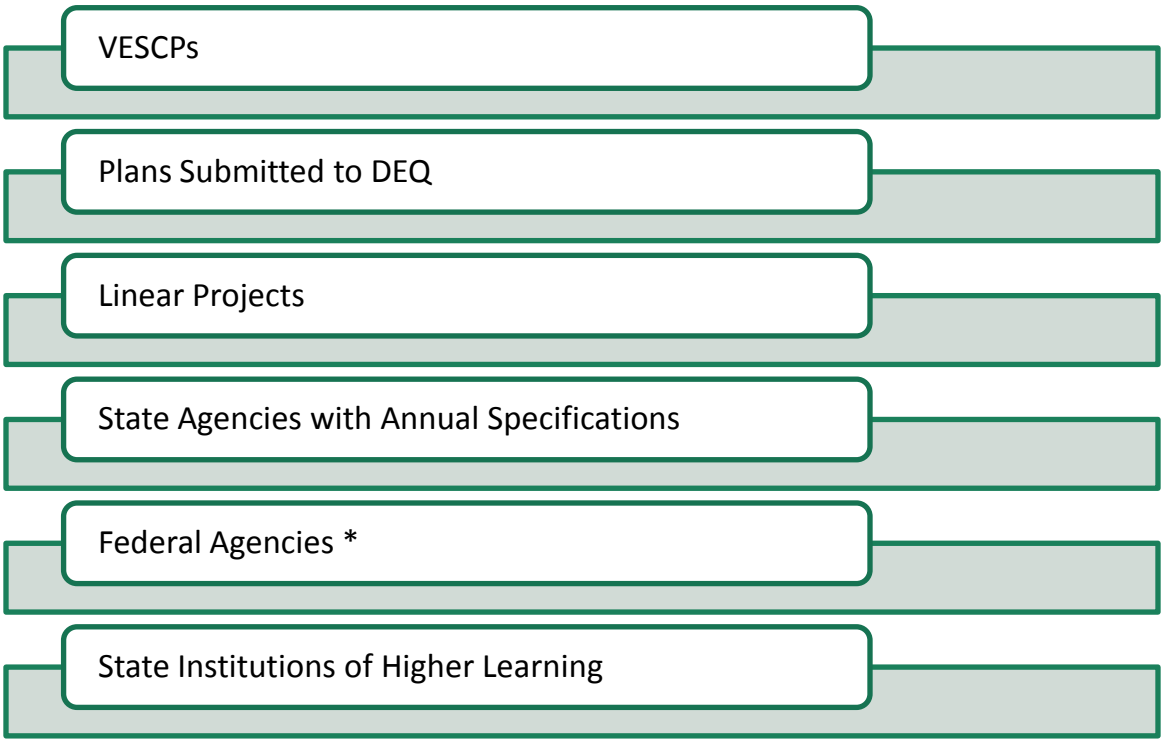
4b. The Regulations (Purpose and Scope)

Purpose. 9VAC25-840-20

The regulations form the basis for the administration, implementation and enforcement of the Act. The intent is to establish the framework for compliance with the Act, while at the same time providing flexibility for innovative solutions to erosion and sediment control concerns

Scope and applicability. 9VAC25-840-30

This section details to whom these regulations, in particular the minimum standards, apply:



* Have to submit plans for review or have standards and specifications

It also allows VESCP authorities to charge a reasonable fee for program administration.

4.c Introduction to the Minimum Standards: 9VAC25-840-40

The objectives of these minimum standards are to create a "level playing' field throughout the state by providing a set of uniform criteria that were applicable to land disturbing activities state-wide. Moreover, it would provide a consistent set of criteria that would allow VESCP staff to interact with each other, with land disturbers and with the public. Finally it provides a uniform set of criteria by which to review a VESCP.

The minimum standards (MS) can be divided into a number of distinct groups. One such grouping is as follows:

- Erosion Control (MS-1, 2, 3, 5),
- Sediment Control (MS-4 and 6),
- Slopes (MS-7, 8 and 9),
- Channels, Culverts and Drains (MS-10 and 11),
- Streams and Wetlands (MS-12, 13, 14 and 15),
- Underground Utility Lines (MS-16),
- Construction Entrances (MS-17),
- Project Completion (MS-18), and
- Post Construction Stormwater Management (MS-19).

If we can control erosion we do not need to do sediment control

It can be argued that all Minimum Standards with the exception of MS-4, MS-6, and MS-17 involve some form of erosion control. This would be in line with the principles expressed in Module 2.

Of the two parts of Erosion and Sediment Control, erosion control is considered the first line of defense and often the most cost-effective. Soil stabilization is almost always the most cost-effective way to control erosion and sedimentation. This can be done by seeding combined with mulching. Sediment control measures such as sediment fences, basins and traps are more expensive to install, maintain, and repair.

4.d Minimum Standards: 1-18

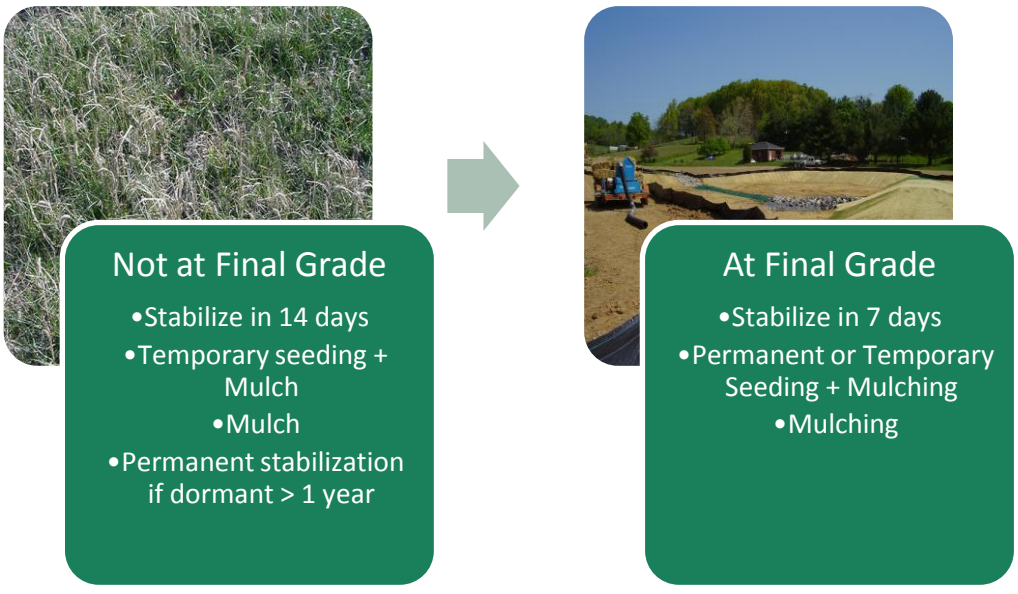
MS-1 Permanent or temporary soil stabilization shall be applied to denuded areas within seven days after final grade is reached on any portion of the site. Temporary soil stabilization shall be applied within seven days to denuded areas that may not be at final grade but will remain dormant for longer than 14 days. Permanent stabilization shall be applied to areas that are to be left dormant for more than one year.

MS-1 was changed as part of the 2012 revisions to the regulations. The changes brought this standard in agreement with the Construction General Permit of 2014 and EPA's Effluent Limit Guidelines (ELGs), which requires that all areas that remain dormant for more than 14 days be stabilized.

Note (1): Areas not at final grade but that remain dormant for more than one year need to receive permanent stabilization (seeding).

Note (2): If final or temporary grade is reached during a period of the year when seeding is not appropriate, a temporary mulch cover should be applied.

Note (3): Grounds cover can reduce the erosion by 90% to 99%.



MS-2 During construction of the project, soil stock piles and borrow areas shall be stabilized or protected with sediment trapping measures. The applicant is responsible for the temporary protection and permanent stabilization of all soil stockpiles on site as well as borrows areas and soil intentionally transported from the project site.

Per MS-1, soil stockpiles and areas that are going to remain dormant for long periods of time (over 14 days) should also be stabilized with some sort of temporary cover (i.e. mulch or annual vegetation, unless it will remain on site for more than one year, then it should be stabilized using permanent vegetation).

Note: This also applies to remote borrow and storage sites

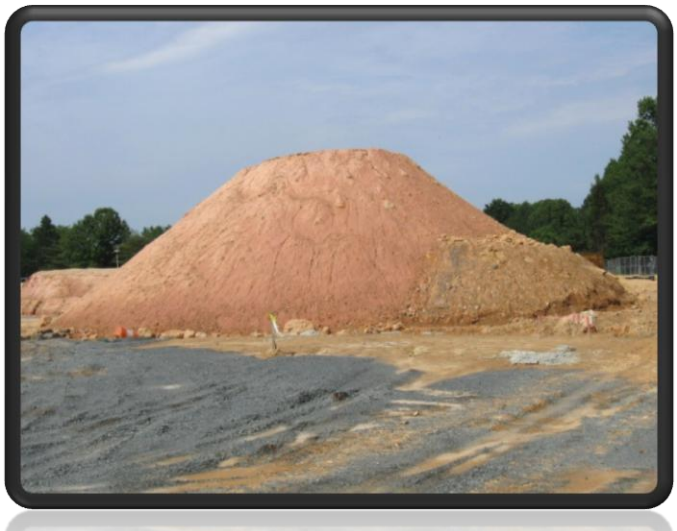


Figure 2. This project is in violation of MS-2 for not having any stabilization or sediment trapping measures.

MS-3 A permanent vegetative cover shall be established on denuded areas not otherwise permanently stabilized. Permanent vegetation shall not be considered established until a ground cover is achieved that is uniform, mature enough to survive and will inhibit erosion.

The final portion of the performance bond or surety may only be released after final stabilization is achieved.

The inspector from the VESCP will have the final say on whether final site stabilization has been achieved.

It is the responsibility of the developer/land disturber to get permanent stabilization of the entire site. This includes pervious (which are inherently stable) **and** impervious areas. This needs to be discussed at the beginning of the project (pre-construction meeting), in order for the developers to make better preparations and obtain the proper resources to do the job correctly and cost effectively.

MS-4 Sediment basins and traps, perimeter dikes, sediment barriers and other measures intended to trap sediment shall be constructed as a first step in any land-disturbing activity and shall be made functional before upslope land disturbance takes place.

This minimum standard is meant to assure that sediment does not leave the LDA once site clearing, grading and construction commences. It is also known as getting the "*perimeter controls*" or as "*first step measures*" in place prior to land disturbance.

A certain amount of initial land disturbance may be required to provide access for equipment to install the perimeter controls, but site clearing and grading should be kept to an absolute minimum until the perimeter controls are in place.

Examples of perimeter controls are:

- Silt fences
- Sediment traps
- Sediment basins
- Construction entrance
- Temporary diversions
- Diversions

MS-5 Stabilization measures shall be applied to earthen structures such as dams, dikes and diversions immediately after installation.

Here MS-5 overrules MS-1. The thought behind this minimum standard is that we do not want any of the erosion and sediment control structures that were installed to become the source of sediment. As we have learned before, ground cover can reduce the erosion by up to 99%, and **immediate** stabilization of our newly constructed earthen sediment control structures is vital in reducing environmental impacts and maintenance cost.

Figure 3. This diversion was seeded and mulched immediately after construction.

MS-6 Sediment traps and sediment basins shall be designed and constructed based upon the total drainage area to be served by the trap or basin.

a) The minimum storage capacity of a sediment trap shall be 134 cubic yards per acre of drainage area and the trap shall only control drainage areas less than three acres.

b) Surface runoff from disturbed areas that is comprised of flow from drainage areas greater than or equal to three acres shall be controlled by a sediment basin. The minimum storage capacity of a sediment basin shall be 134 cubic yards per acre of drainage area. The outfall system shall, at a minimum, maintain the structural integrity of the basin during a 25-year storm of 24-hour duration. Runoff coefficients used in runoff calculations shall correspond to a bare earth condition or those conditions expected to exist while the sediment basin is utilized.

These sediment trapping devises should be placed near the lowest points of a project, installed as a first step measure (MS-4), stabilized immediately (MS-5) and have some form of outlet protection (MS-11). Sediment basins are usually expensive to install and maintain.

Note: 134 cubic feet per acre is equivalent to one inch runoff per acre

MS-7 Cut and fill slopes shall be designed and constructed in a manner that will minimize erosion. Slopes that are found to be eroding excessively within one year of permanent stabilization shall be provided with additional slope stabilizing measures until the problem is corrected.

Because the developer is responsible for the stability of slopes for one year following their construction, it is important for the project superintendent and the inspector to mutually note the date on which slope construction was completed.

VESCPs may choose to hold back part of the performance bond/surety until the end of the one year period.

By roughening the surface of the slope, there will be less runoff, lower velocity runoff, more water retention and better seed germination. This practice should generally be implemented unless the slope will require a high degree of maintenance mowing after vegetative establishment.

MS-8 Concentrated runoff shall not flow down cut or fill slopes unless contained within an adequate temporary or permanent channel, flume or slope drain structure.

While plants on slope need water for germination and establishment, cut and fill slopes are inherently unstable and any runoff from upgradient areas must be brought down the slope in a non-erodible way.

Figure 5. Temporary slope drain

MS-9 Whenever water seeps from a slope face, adequate drainage or other protection shall be provided.

Cut and fill operations may expose shallow aquifers or groundwater tables from which water may seep through the side of a slope. These water seeps can cause slopes to erode or slough from the soil's weight above.

MS-10 All storm sewer inlets that are made operable during construction shall be protected so that sediment-laden water cannot enter the conveyance system without first being filtered or otherwise treated to remove sediment.

Figure 6. Proper inlet protection

Storm sewers are designed to efficiently transport stormwater away from the site. When sediment enters the storm sewer system, two negative effects can occur:

1. When the velocity of flow is high, much of the sediment will be quickly transported to the nearest receiving channel, defeating the purpose of a sediment control program, or
2. When the velocity of the flow is low, the sediment may be deposited in the pipes resulting in clogging.

Since the stormwater points of entry are usually limited to a few designated inlets, the job of keeping sediment out is generally not too difficult.

The cost to clean out the stormwater infrastructure of a site is well over $8.00 per cubic yard of sediment for street and culvert, and more than $60.00 per cubic yard for hydro-flushing of storm sewers.

MS-11 Before newly constructed stormwater conveyance channels or pipes are made operational, adequate outlet protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel and receiving channel.

Figure 7. Proper outlet protection

Developers are responsible for the conveying concentrated stormwater on their site (on-site channels) without erosion. These channels need to be adequate (MS-19) and stabilized (per MS-5 and MS-11) before made operational, so that they themselves do not become the source of sediment coming from a site.

MS-12 When work in a live watercourse is performed, precautions shall be taken to minimize encroachment, control sediment transport and stabilize the work area to the greatest extent possible during construction. Nonerodible material shall be used for the construction of causeways and cofferdams. Earthen fill may be used for these structures if armored by nonerodible cover materials.

Water is the most important erodible force, and a stream bank that is not stabilized will erode instantly when water flows past it. Erosion in live streams is a critical issue because 100% of the eroded material will be moved downstream. Therefore, the best way to avoid the problem of erosion in stream channels is to stay out of them in the first place, and if work needs to be done in a live stream, to minimize the disturbance to the disturbance are as much as possible.

Any disturbance needs to be stabilized immediately up on completion per this minimum standard and MS-15.

MS-13 When a live watercourse must be crossed by construction vehicles more than twice in any six-month period, a temporary vehicular stream crossing constructed of nonerodible material shall be provided.

Figure 8. Properly installed temporary stream crossing

In order to minimize erosion during stream crossing, the contractor must follow the construction specifications for temporary stream crossings.

MS-14 All applicable federal, state and local requirements pertaining to working in or crossing live watercourses shall be met.

Any activity in live water courses usually fall under the jurisdiction of other agencies and/or regulations, including the U.S. Army Corps of Engineers, DEQ's 401 permitting regulations, time of year restrictions by DGIF, or local wetland board. All applicable permits need to be obtained and need to be available on site before construction in live water courses may start.

Water bodies may be identified through wetlands delineation, followed by a jurisdictional determination by the U.S. Army Corps of Engineers. Wetlands and streams and other water bodies and the impact on these water bodies are usually indicated on plats, sometimes including permit numbers.

Note: Jurisdiction of wetlands and shorelines in coastal areas and areas under the Chesapeake Bay Act may have complicated jurisdictional divisions.

MS -15 The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse is completed.

When working in live water courses, MS-15 overrules MS-1 and stabilization must be done immediately after completion of the work. See also MS-12 for a discussion on this subject.

When working in water, safety of the equipment and workers is important, and weather consideration should be a big factor in knowing when to work in live water courses or when to stop.

MS-16 Underground utility lines shall be installed in accordance with the following standards in addition to other applicable criteria:

a) No more than 500 linear feet of trench may be opened at one time.

b) Excavated material shall be placed on the uphill side of trenches.

c) Effluent from dewatering operations shall be filtered or passed through approved sediment trapping devices (or both), before being discharged in a manner that does not adversely affect flowing streams or off-site property.

d) Material used for backfilling trenches shall be properly compacted in order to minimize erosion and promote stabilization.

e) Restabilization shall be accomplished in accordance with this chapter.

f) Applicable safety requirements shall be complied with.

Because gravity sewers follow natural drainage patterns and very long utility lines usually end up crossing live streams, the project superintendent and inspector should pay particular attention to erosion and sediment controls on utility projects when the work is in close proximity to live streams.

The basic principles of controlling erosion and sedimentation on utility projects are not unique and the key is to get the trench back-filled and stabilized as soon as possible.

Some of the other agencies that regulate pipelines include DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA), Federal Energy Regulatory Commission (FERC), and Occupational Safety and Health Administration (OSHA).

MS-17 Where construction vehicle access routes intersect paved or public roads, provisions shall be made to minimize the transport of sediment by vehicular tracking onto the paved surface. Where sediment is transported onto a paved or public road surface, the road surface shall be cleaned thoroughly at the end of each day. Sediment shall be removed from the roads by shoveling or sweeping and transported to a sediment control disposal area. Street washing shall be allowed only after sediment is removed in this manner. This provision shall apply to individual development lots as well as to larger land-disturbing activities.

During wet weather, construction traffic can transport a significant amount of sediment (i.e. mud) onto paved public roads. This represents not only a sedimentation problem but a safety hazard and public nuisance as well.

The superintendent is responsible for keeping public roads adjacent to his project clean. Mud should be swept or shoveled off the road and deposited on areas where it will not cause another sedimentation problem

Only washing the pavement is not acceptable because the sediment would be washed into drains and ditches where it will cause clogging or would eventually be transported into the stormwater drainage systems and receiving channels.

Washing should be avoided when freezing weather is expected.

MS-18 All temporary erosion and sediment control measures shall be removed within 30 days after final site stabilization or after the temporary measures are no longer needed, unless otherwise authorized by the VESCP authority. Trapped sediment and the disturbed soil areas resulting from the disposition of temporary measures shall be permanently stabilized to prevent further erosion and sedimentation

Temporary erosion and sediment control measures can become a problem if left in place beyond their useful life: Sediment fences can trap wildlife and small animals, sediment basins can become drowning hazards or sources of sediment in cases of failure, and they become unsightly.

They should be removed and the area should be stabilized as soon as their function has been completed.

Note: Some sediment basins are designed to be converted to stormwater basins at the end of a project. This can only be done once final stabilization has been achieved. In the field these basins are usually constructed with concrete outfall structures.

4.e Stormwater Management

Why Address Stormwater Management in the Erosion and Sediment Control Regulations?

At the time of the development of the Erosion and Sediment Control Law and Regulations (ESCL&R) there were no state law and regulations that addressed stormwater running off from a construction site or developed area. Since the ESCL&R was the only law that dealt with water coming from construction sites, it was decided to address it in these documents.

It was early on recognized that in addition to sediment, development altered the hydrology of an area, which is illustrated in the picture below, where the increased development created more impervious area and most likely more runoff.

Figure 12. Typical Changes in Land Surface (1958 – 1999) for a Commercial Area (Source: ARC, 2001)

Hydrologic changes are further impacted with the widespread use of built drainage systems such as gutters, storm sewers (**Figure** and **14** below) and smooth-lined channels that are designed to quickly carry runoff to rivers and streams. This further reduces water infiltration into the soil and groundwater (and the amount of water that can recharge aquifers and feed streamflow during periods of dry weather).

Figure 13. Impervious Cover Increases Stormwater Runoff and Pollutants. (Source: ARC, 2001)

Some changes seen as the results of development:

1. Climate changed (heat island)
2. Topsoil removal exposing less permeable, less fertile, and sometimes more erodible sub soils
3. Soil compaction
4. Topographic changes
5. Changes in groundcover
6. Contaminated runoff
7. Decreased overland flow
8. Channel modification
9. Changes in stream hydrology
10. Falling groundwater tables

Figure 14. Constructed Storm Drainage System Components. (Source: Chesapeake Bay Stormwater Training Partnership)

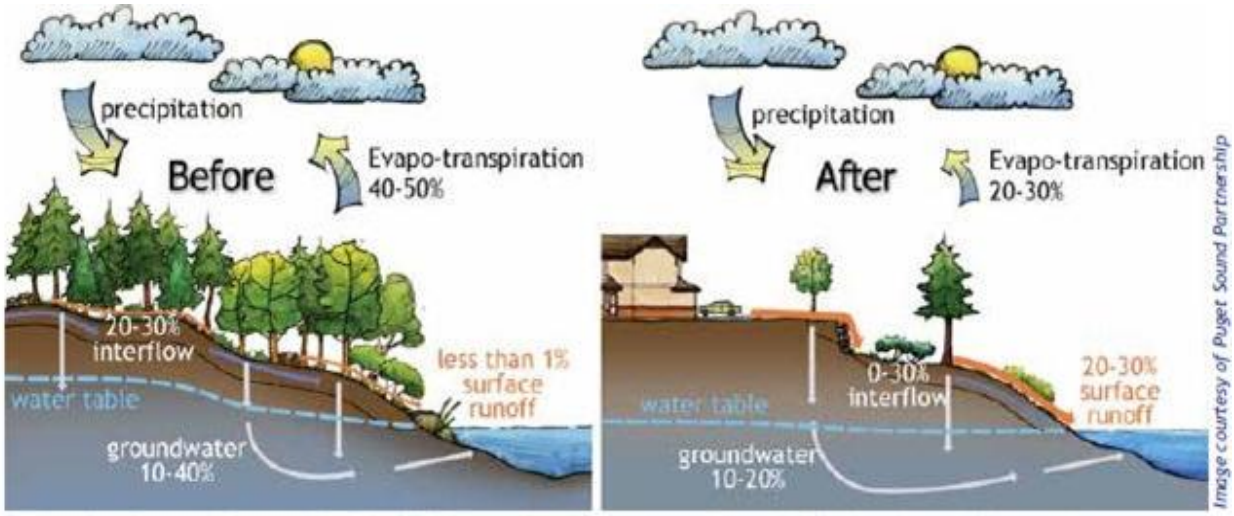
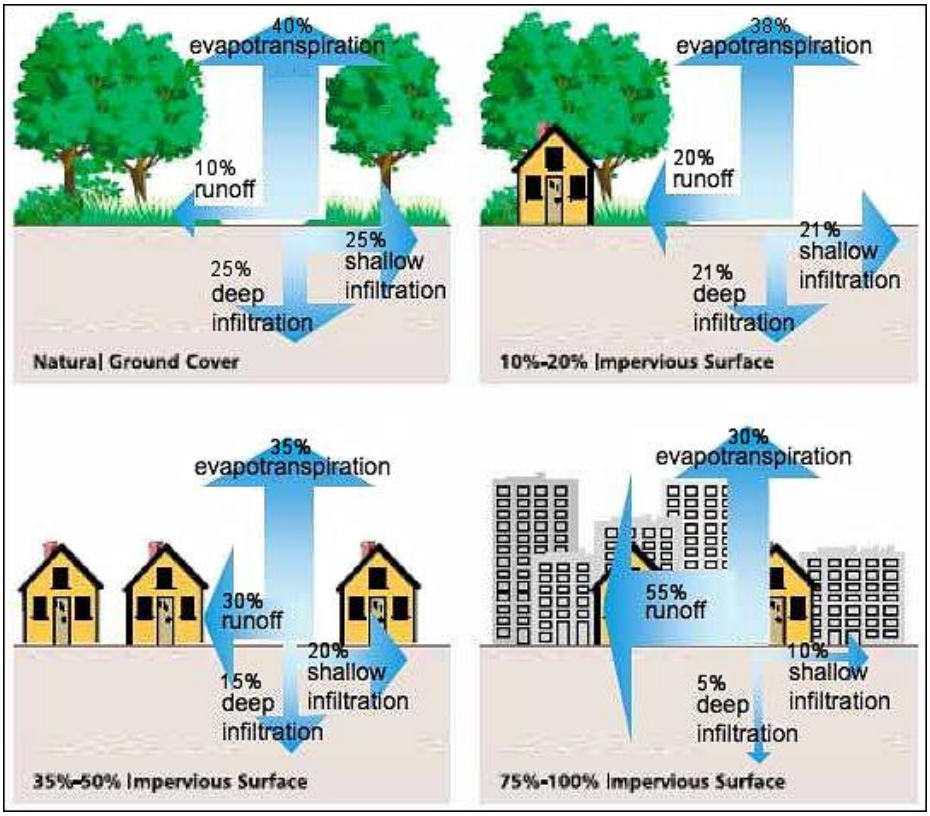


Figure 15. Changes in hydrology and land cover before (left) and after (right) development. (Source: Puget Sound Partnership, 2013)

How does the change in impervious cover affect runoff?

Although the total amount of rainfall varies somewhat in different regions of the state, the basic changes to the hydrologic cycle holds true (**Figure 16** below).



Impervious cover – ground surface that does not allow water absorption or infiltration but rather results in surface runoff

Figure 16. Relationship Between Impervious Cover and Surface Runoff.
(Source: Federal Interagency SWRG, 1998)

Impervious surfaces (roads, buildings, parking lots):

- Prevent rainfall from infiltrating into the soil and significantly increase surface runoff.
- Replace natural vegetation that alter natural drainage patterns
    - Evapo-transpiration and infiltration decrease
    - Runoff increases in volume and flow rate

Altering one component of the water cycle affects all other elements of the cycle

How does the change in stormwater runoff influence stream hydrology?

Where land development has occurred, the increase in volume and velocity of stormwater runoff to receiving waters results in significant changes to stream flow characteristics:

- Increased peak discharges for a developed watershed can be two to five times higher than those for an undisturbed watershed.
- As runoff velocities increase, it takes less time for water to run off the land and reach a stream or other water body (time of concentration).

Time of concentration is the time needed for water to flow from the most remote point in a watershed to the watershed outlet **or** time required for 100% contribution from all points in a watershed during any uniform storm having sufficient duration

- Streams in developed areas can be more volatile because of their response to these altered runoff characteristics.
- This characterization translates into the sharp peak and increased size of the post-development hydrograph as seen in **Figure 1**7 below, which depicts typical pre-development and post-development streamflow hydrographs for a developed watershed.

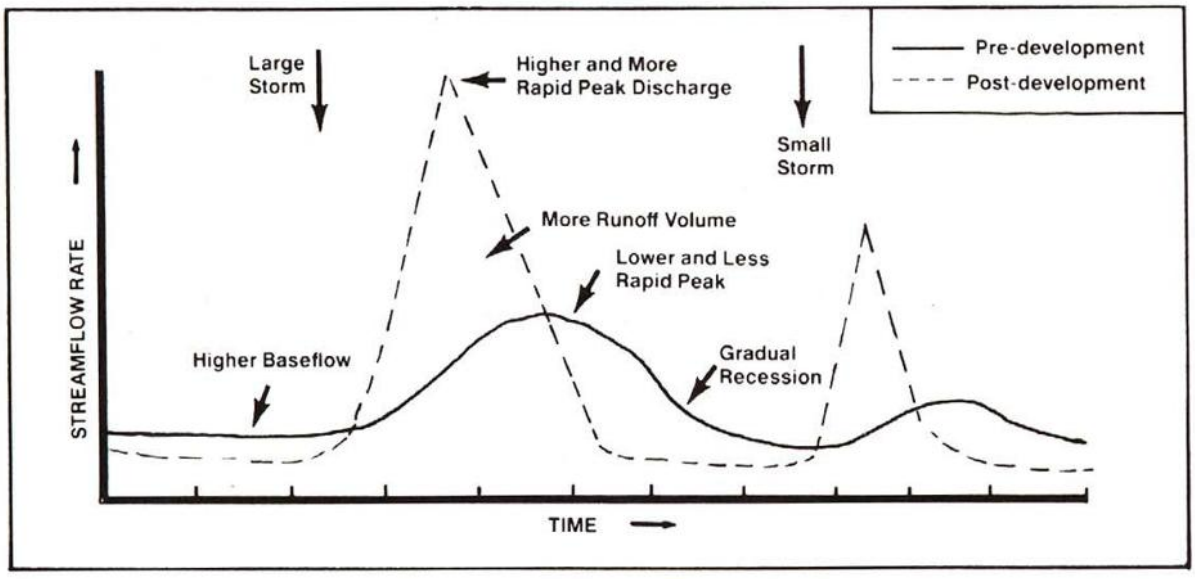


Figure 1. Pre- and Post-Development Stormwater Runoff Hydrographs

In summary, the figure below reminds us why we manage stormwater.

Stormwater Management in the past vs. the present

Old (Traditional)

- MS-19 (State-wide)
- Stormwater (CBPA localities)
- >10,000 sqf or more stringent
- Quantity based
- Management of discharge

New (Modern)

- VSMP Law and Regulations
- Areas >1 acre (in CBPA area >2,500 sqf
- Quality and quanity (energy balance)
- Runoff Reduction (infiltration/re-use)
- After July 1, 2014
- Grandfathered projects and projects between 10,000 sqf and 1 acre not in CBPS areas will still be regulated through MS-19

What do we do?

How has our approach changed over time?

4.f Minimum Standard 19 (MS-19)

Properties and waterways downstream from development sites shall be protected from sediment deposition, erosion and damage due to increases in volume, velocity and peak flow rate of stormwater runoff for the stated frequency storm of 24-hour duration in accordance with the following standards and criteria. Stream restoration and relocation projects that incorporate natural channel design concepts are not man-made channels and shall be exempt from any flow rate capacity and velocity requirements for natural or man-made channels:

The State Stormwater Runoff Standard primary objective is to protect downstream properties and waterways.

a) Concentrated stormwater runoff leaving a development site shall be discharged directly into an adequate natural or man-made receiving channel, pipe or storm sewer system. For those sites where runoff is discharged into a pipe or pipe system, downstream stability analyses at the outfall of the pipe or pipe system shall be performed.

MS-19 has a channel adequacy requirement

b) Adequacy of all channels and pipes shall be verified in the following manner:

   i. The applicant shall demonstrate that the total drainage area to the point of analysis within the channel is one hundred times greater than the contributing drainage area of the project in question; or

   ii. (a) Natural channels shall be analyzed by the use of a two-year storm to verify that stormwater will not overtop channel banks nor cause erosion of channel bed or banks.

   (b) All previously constructed man-made channels shall be analyzed by the use of a ten-year storm to verify that stormwater will not overtop its

Channel adequacy analysis is done at 3 points in the receiving channel. Current recommendations are: at the outfall and two additional points downstream (at 50 foot intervals).

banks and by the use of a two-year storm to demonstrate that stormwater will not cause erosion of channel bed or banks; and

(c) Pipes and storm sewer systems shall be analyzed by the use of a ten-year storm to verify that stormwater will be contained within the pipe or system.

1% rule	• **Channel is assumed to be adequate**
Natural Channel	• **2-year storm does not overtop bed and banks** • **2-year storm does not cause erosion of bed and banks**
Man-Made Channel	• **10-year storm does not overtop bed and banks** • **2-year storm does not cause erosion of bed and banks**
Stormwater Infrastructure (pipes)	• **Be able to handle the capacity of a 10-year storm**

c) If existing natural receiving channels or previously constructed man-made channels or pipes are not adequate, the applicant shall:

i) Improve the channels to a condition where a ten-year storm will not overtop the banks and a two-year storm will not cause erosion to the channel, the bed, or the banks; or

ii) Improve the pipe or pipe system to a condition where the ten-year storm is contained within the appurtenances;

When you improve a channel a natural channel becomes a man-made channel, unless we use natural channel design!

iii) Develop a site design that will not cause the pre-development peak runoff rate from a two-year storm to increase when runoff outfalls into a natural channel or will not cause the pre-development peak runoff rate from a ten-year storm to increase when runoff outfalls into a man-made channel; or

Section C (iii) of MS-19 is the section which calls for the use of stormwater management ponds and Low Impact Development (LID) to manage stormwater on-site.

iv) Provide a combination of channel improvement, stormwater detention or other measures which is satisfactory to the VESCP authority to prevent downstream erosion.

The State minimum standard requires developers to analyze the off-site receiving streams or pipes which will be affected by runoff from their development projects. The developer must prove – through engineering calculations- that the receiving channels are "adequate" to carry the peak flow expected from a 2-year frequency storm without eroding or over topping their banks.

d) The applicant shall provide evidence of permission to make the improvements.

e) All hydrologic analyses shall be based on the existing watershed characteristics and the ultimate development condition of the subject project.

f) If the applicant chooses an option that includes stormwater detention, he shall obtain approval from the VESCP of a plan for maintenance of the detention facilities. The plan shall set forth the maintenance requirements of the facility and the person responsible for performing the maintenance.

Stormwater BMPs are required to have a maintenance plan/schedule.

g) Outfall from a detention facility shall be discharged to a receiving channel, and energy dissipators shall be placed at the outfall of all detention facilities as necessary to provide a stabilized transition from the facility to the receiving channel.

h) All on-site channels must be verified to be adequate.

i) Increased volumes of sheet flows that may cause erosion or sedimentation on adjacent property shall be diverted to a stable outlet, adequate channel, pipe or pipe system, or to a detention facility.

j) In applying these stormwater management criteria, individual lots or parcels in a residential, commercial or industrial development shall not be considered to be separate development projects. Instead, the development, as a whole, shall be considered to be a single development project. Hydrologic parameters that reflect the ultimate development condition shall be used in all engineering calculations.

k) All measures used to protect properties and waterways shall be employed in a manner which minimizes impacts on the physical, chemical and biological integrity of rivers, streams and other waters of the state.

l) Any plan approved prior to July 1, 2014, that provides for stormwater management that addresses any flow rate capacity and velocity requirements for natural or man-made channels shall satisfy the flow rate capacity and velocity requirements for natural or man-made channels if the practices are designed to:

   i. detain the water quality volume and to release it over 48 hours;

   ii. detain and release over a 24-hour period the expected rainfall resulting from the one year, 24-hour storm; and

   iii. reduce the allowable peak flow rate resulting from the 1.5, 2, and 10-year, 24-hour storms to a level that is less than or equal to the peak flow rate from the site assuming it was in a good forested condition, achieved through multiplication of the forested peak flow rate by a reduction factor that is equal to the runoff volume from the site when it was in a good forested condition divided by the runoff volume from the site in its proposed condition, and shall be exempt

Sections (l) through (n) were added in 2012 as part of the consolidation bill and lay the link between MS-19 and the VSMP Law and Regulations.

from any flow rate capacity and velocity requirements for natural or man-made channels as defined in any regulations promulgated pursuant to § 62.1-44.15:54 or 62.1-44.15:65 of the Act.

m) For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements of § 62.1-44.15:52 A of the Act and this subsection shall be satisfied by compliance with water quantity requirements in the Stormwater Management Act (§ 62.1-44.15:24 et seq. of the Code of Virginia) and attendant regulations, unless such land-disturbing activities are in accordance with 9VAC25-870-48 of the Virginia Stormwater Management Program (VSMP) Regulations.

n) Compliance with the water quantity minimum standards set out in 9VAC25-870-66 of the Virginia Stormwater Management Program (VSMP) Regulations shall be deemed to satisfy the requirements of subdivision 19 of this subsection.

Developers are responsible for managing resulting stormwater in a manner that will prevent erosion damage to downstream properties and waterways. While the measures which are taken to satisfy this standard are usually selected and designed in the site planning stage, it is the primary role of the job superintendent and inspector to see that the stormwater management practices are installed properly and on time.

Inspectors should continually monitor all points where concentrated stormwater runoff will leave the site. If erosion is detected immediately at the outlet of pipes or paved channels, riprap outlet protection may correct the problem. However, if channel erosion is evident for a significant distance downstream, it may signal the need for a stormwater best management practice.

4.g Variances: 9VAC25-840-50

The VESCP authority may waive or modify any of the requirements that are deemed inappropriate or too restrictive for site conditions, by granting a variance. A variance may be granted under these conditions:

Request

- **At time of plan submittal**
- **During construction when field conditions/situations changes**
- **Must be done in writing**
- **Cannot be done for economic reasons (ie, too expensive)**

Review

- **10 days**
- **After 10 days, it is automatically denied**
- **Review must be judicious**

Note: If an Erosion and Sediment Control Plan is incorporated by reference into a Stormwater Pollution Prevention Plan (SWPPP) under the Construction General Permit, any required elements of the SWPPP that are missing from the E&S plan because of a variance must be developed and included in the SWPPP.

While the regulations provide local officials with the authority to accept alternative solutions that may be more cost-effective or appropriate for site conditions, it is important to understand that the variance procedure is not automatic.

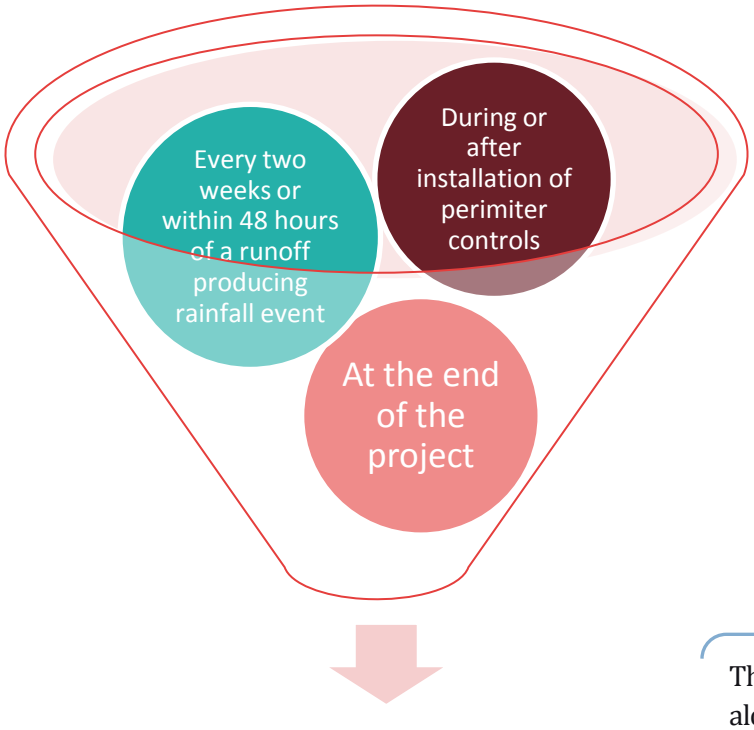
Variances requested after plan approval must be requested and approved in writing.

The VESCP authority should take a conservative and responsible approach, keeping in mind the need to protect the environment from damage due to soil erosion, sediment deposition, and nonagricultural runoff. Variances will only pass muster when they are reasonable and supported by site-specific rationale.

4.h Maintenance and Inspections: 9VAC25-840-60

All erosion and sediment control structures and systems shall be maintained, inspected and repaired as needed to insure continued performance of their intended function. A statement describing the maintenance responsibilities of the permittee shall be included in the approved erosion and sediment control plan.

Periodic inspections are required on all projects by the VESCP authority. The VESCP authority shall either:



The VESCP can no longer stand alone. The responsibility to perform "dual" inspections under the authority of VESCP and VSMP is likely.

Alternative inspection programs are allowed as long as they ensure compliance with the approved erosion and sediment control plan. Any alternative inspection program shall be:

a) Approved by the board prior to implementation;
b) Established in writing;
c) Based on a system of priorities that, at a minimum, address the amount of disturbed project area, site conditions and stage of construction; and
d) Documented by inspection records.

Knowledge Check

1. Sediment traps and basins are designed to serve _____?

    a. The area being cleared.
    b. The drainage area of the project.
    c. 2 years storms.

2. Once a project starts construction, the regulations prohibit a variance request being made?

    a. True
    b. False

3. Identify the four phases for which inspections should be provided.

    a. Immediately following initial installation of erosion and sediment controls
    b. At least once in every two-week period
    c. Within 48 hours following any runoff producing storm event
    d. At project completion; prior to the release of any performance bonds.
    e. All the above

4. Which is NOT one of the minimum criteria for VESCP authorization/approval by DEQ?

    a. Identification of any outsourced contracts (such as inspection).
    b. Administrative procedures for plan review/submittal.
    c. Provisions for integrating stormwater management & flood plain aspects.
    d. Pending outcome of statewide elections.

5. For plans approved on and after July 1, 2014, the flow rate capacity and velocity requirements are determined by:

   a. The cash flow of the developer
   b. Virginia Stormwater Management Act
   c. 2 year frequency storm
   d. 48 hours of retention

6. Stabilization must occur when soil stockpiles are dormant more than _____ days and also within _____ days of final grade?

   a. 30, 14
   b. 7, 14
   c. 14, 7
   d. 7, 3

Minimum Standard #	Summary Description/Purpose of Standard
MS 1	**Addresses permanent and temporary soil stabilization: within 7 days when site is at final grade and on sites that are not art final grade but remain dormant for more than 14 days.**
MS 2	**Soil Stockpiles and borrow areas must be stabilized or protected with sediment trapping measures. This includes off site/remote areas. According to MS-1, piles dormant > 14 days should be temporary seeded.**
MS 3	**Permanent Stabilization: must be applied to areas not otherwise permanently stabilized. Ground cover needs to be uniform, mature enough to survive and inhibit erosion.**
MS 4	**Perimeter controls (sediment basins, traps, perimeter dikes, sediment barriers or etc) must be installed as first measures in any LDA and shall be made functional before upslope LDA occurs.**
MS 5	**Stabilization practice shall be applied immediately to earthen structures (such as dams, dikes & diversions) after installation.**
MS 6	**Sediment traps & basins shall be designed & constructed based on the total drainage area they serve.**
MS 7	**Cut and fill slopes shall be designed & constructed in a manner that will minimize erosion.**
MS 8	**Concentrated runoff shall not flow down a cut or fill slope unless contained in an adequate temporary or permanent channel, flume or slope drain structure.**
MS 9	**Where water seeps from a slope face, adequate drainage or other protection shall be provided.**
MS 10	**All storm inlet made operable during construction must be protected so sediment laden water cannot enter without first being filtered.**

MS 11	**Before any newly constructed stormwater conveyance channel can be made operational, adequate protection and any required temporary or permanent channel lining shall be installed in both the conveyance channel & receiving channel.**
MS 12	**Minimize encroachment to live water course. Use non-erodible materials shall be used for constructing of causeways and coffer dams; earthen material may be used if armored by non-erodible material.**
MS 13	**When construction vehicles must cross a live water course more than twice in a 6 month period, a temporary stream crossing of non-erodible material must be provided.**
MS 14	**When working in a live water course, all applicable Federal, State and local regulations pertaining to the activity must be met.**
MS 15	**The bed and banks of a watercourse shall be stabilized immediately after work in the watercourse has been completed.**
MS 16	**Underground utility lines can have no more than 500 feet open trench and need to be stabilized as soon as possible. All dewatering operations shall be filtered before water leaves the site.**
MS 17	**Provisions shall be made to minimize the transport of sediment from the site onto paved surfaces.**
MS 18	**All temporary ESC measures shall be removed within 30 days of achieving a stabilized final grade or when the measure is no longer needed.**
MS 19	**Stormwater runoff standard: Protect properties and waterways downstream from an LDA from erosion and sediment deposition due to increases in peak stormwater runoff.**

DEQ's Quick Reference List of the Minimum Standards

MS-1	**Stabilization**
MS-2	**Stock Piles, Waste and Borrow Areas**
MS-3	**Permanent Vegetation**
MS-4	**First-Step Measures**
MS-5	**Earthen Structure Stabilization**
MS-6	**Traps and Basins**
MS-7	**Cut & Fill Slopes**
MS-8	**Concentrated Runoff**
MS-9	**Water Seeps**
MS-10	**Inlet Protection**
MS-11	**Outlet Protection**
MS-12	**Watercourse Construction**
MS-13	**Temporary Stream Crossing**
MS-14	**Other Watercourse Regulations**
MS-15	**Bed and Bank Stabilization**
MS-16	**Utility Construction**
MS17	**Vehicular Tracking and Construction Entrances**
MS-18	**Control Removal**
MS-19	**Downstream and Property Protection**